

WHAT IS CLAIMED IS:

1. An electronic coupon sending/collecting method for sending/collecting an electronic coupon to/from a radio portable terminal by using a radio LAN, the method comprising the steps of:
- (a) requesting a notification of a terminal identifier of the radio portable terminal from a radio base station of the radio LAN to the radio portable terminal through the radio LAN;
  - (b) receiving the notification of the terminal identifier of the radio portable terminal from the radio portable terminal at the radio base station through the radio LAN in response to the step (a);
  - (c) requesting a check of whether the radio portable terminal of the terminal identifier notified by the step (b) is an electronic coupon sending/collecting target or not, from the radio base station to a server device;
  - (d) checking whether the radio portable terminal of the terminal identifier notified by the step (b) is the electronic coupon sending/collecting target or not at the server device, and notifying a result of the check from the server device to the radio base station in response to the step (c); and
  - (e) carrying out processing for sending/collecting the electronic coupon at the radio base station with respect to the radio portable terminal through the radio LAN, when the result of the check notified by the step (d) indicates that the radio portable terminal of the terminal identifier notified by the step (b) is the electronic coupon sending/collecting target.
2. An electronic coupon sending/collecting system for sending/collecting an electronic coupon to/from a radio portable terminal by using a radio LAN, the system

comprising:

a radio base station of the radio LAN for carrying out communications with the radio portable terminal through the radio LAN; and

- 5 a server device for managing information regarding the electronic coupon;

wherein the radio base station has:

- a first communication unit configured to send a first request message requesting a notification of a terminal identifier of the radio portable terminal to the radio portable terminal through the radio LAN, and to receive a first response message notifying the terminal identifier of the radio portable terminal from the radio portable terminal through the radio LAN in response to the first request message;
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- a second communication unit configured to send to the server device a second request message containing the terminal identifier notified by the first response message and requesting a check of whether the radio portable terminal of the terminal identifier notified by the first response message is an electronic coupon sending/collecting target or not, and to receive a second response message indicating a result of the check from the server device in response to the second request message; and
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- a processing unit configured to carry out processing for sending/collecting the electronic coupon with respect to the radio portable terminal through the radio LAN, when the result of the check notified by the second response message indicates that the radio portable terminal of the terminal identifier notified by the first response message is the electronic coupon sending/collecting target;
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and the server device has:

- a communication unit configured to receive the second request message from the radio base station and to
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send the second response message to the radio base station in response to the second request message; and

a coupon processing unit configured to check whether the radio portable terminal of the terminal identifier contained in the second request message is the electronic coupon sending/collecting target or not, and to produce the second response message indicating the result of the check.

10 3. The system of claim 2, wherein the second communication unit of the radio base station is also configured to send to the server device a third request message containing the terminal identifier notified by the first response message and requesting a notification of a coupon identifier of the electronic coupon to be sent to the radio portable terminal of the terminal identifier notified by the first response message, when the radio portable terminal of the terminal identifier notified by the first response message is the electronic coupon sending/collecting target, and to receive a third response message notifying the coupon identifier from the server device in response to the third request message;

the communication unit of the server device is also configured to receive the third request message from the radio base station and to send the third response message to the radio base station in response to the third request message;

the coupon processing unit of the server device is also configured to determine the coupon identifier of the electronic coupon to be sent to the radio portable terminal of the terminal identifier contained in the third request message, and to produce the third response message indicating the coupon identifier; and

the processing unit of the radio base station is also configured to carry out processing for sending the

electronic coupon to the radio portable terminal, according to the coupon identifier notified by the third response message.

5 4. The system of claim 2, wherein the second communication unit of the radio base station is also configured to send to the server device a fourth request message containing the terminal identifier notified by the first response message and requesting a transmission of  
10 data of the electronic coupon to be sent to the radio portable terminal of the terminal identifier notified by the first response message, when the radio portable terminal of the terminal identifier notified by the first response message is the electronic coupon  
15 sending/collecting target, and to receive a fourth response message containing the data of the electronic coupon from the server device in response to the fourth request message;

the communication unit of the server device is also  
20 configured to receive the fourth request message from the radio base station and to send the fourth response message to the radio base station in response to the fourth request message;

the coupon processing unit of the server device is  
25 also configured to determine a coupon identifier of the electronic coupon to be sent to the radio portable terminal of the terminal identifier contained in the fourth request message, and to produce the fourth response message containing the data of the electronic coupon of the coupon  
30 identifier; and

the processing unit of the radio base station is also configured to carry out processing for sending the electronic coupon to the radio portable terminal, using the data of the electronic coupon contained in the fourth  
35 response message.

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5. The system of the claim 2, wherein the first communication unit of the radio base station is also configured to send a fifth request message requesting a notification of a display contents description format to the radio portable terminal through the radio LAN, and to receive a fifth response message notifying the display contents description format from the radio portable terminal through the radio LAN in response to the fifth request message; and

the processing unit of the radio base station is also configured to carry out processing for sending the electronic coupon that contains display contents described by the display contents description format notified by the fifth response message, to the radio portable terminal.

6. The system of claim 5, wherein the second communication unit of the radio base station is also configured to send to the server device a sixth request message containing the terminal identifier notified by the first response message and the display contents description format notified by the fifth response message and requesting a transmission of data of the electronic coupon to be sent to the radio portable terminal of the terminal identifier notified by the first response message, when the radio portable terminal of the terminal identifier notified by the first response message is the electronic coupon sending/collecting target, and to receive a sixth response message containing the data of the electronic coupon from the server device in response to the sixth request message;

the communication unit of the server device is also configured to receive the sixth request message from the radio base station and to send the sixth response message to the radio base station in response to the sixth request message;

the coupon processing unit of the server device is also configured to determine a coupon identifier of the electronic coupon to be sent to the radio portable terminal of the terminal identifier contained in the sixth response message, and to produce the sixth response message containing the data of the electronic coupon of the coupon identifier that contains display contents described by the display contents description format contained in the sixth request message.

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7. The system of claim 2, wherein the processing unit of the radio base station is also configured to carry out processing for sending the electronic coupon that contains at least a coupon identifier for uniquely identifying the electronic coupon and display contents regarding the electronic coupon.

8. The system of claim 7, wherein the processing unit of the radio base station is also configured to carry out processing for sending the electronic coupon that also contains a control information regarding a use of the electronic coupon.

9. The system of claim 7, wherein the processing unit of the radio base station is also configured to carry out processing for sending the electronic coupon that also contains an electronic signature obtained by encrypting at least a portion of data of the electronic coupon that should be protected from alteration, by using a secret key that is maintained in the radio base station and/or the server device.

10. The system of claim 7, wherein the processing unit of the radio base station is also configured to carry out processing for sending the electronic coupon that also

contains an electronic signature obtained by encrypting at least a portion of data of the electronic coupon that should be protected from alteration and the terminal identifier of the radio portable terminal, by using a  
5 secret key that is maintained in the radio base station and/or the server device.

11. The system of the claim 2, wherein the first communication unit of the radio base station is also  
10 configured to send a seventh request message requesting information of the electronic coupon to be collected by the radio base station to the radio portable terminal through the radio LAN, and to receive a seventh response message containing at least first information necessary in  
15 identifying the electronic coupon to be collected and second information necessary in verifying validity of the electronic coupon to be collected, from the radio portable terminal through the radio LAN; and

the second communication unit of the radio base  
20 station is also configured to send to the server device an eighth request message containing at least the first information and the second information contained in the seventh response message and requesting a verification of the validity of the electronic coupon to be collected, and  
25 to receive an eighth response message containing a result of the verification from the server device in response to the eighth request message;

the communication unit of the server device is also configured to receive the eighth request message from the  
30 radio base station and to send the eighth response message to the radio base station in response to the eighth request message;

the coupon processing unit of the server device is also configured to verify the validity of the electronic  
35 coupon to be collected according to the first information

and the second information contained in the eighth request message, and to produce the eighth response message containing the result of the verification; and

the processing unit of the radio base station is also  
5 configured to command the radio portable terminal to delete data of the electronic coupon to be collected through the radio LAN, when the result of the verification notified by the eighth response message indicates that the validity of the electronic coupon to be collected is confirmed.

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12. The system of claim 11, further comprising:

a register device configured to execute a transaction for a user of the radio portable terminal;

wherein the coupon processing unit of the server  
15 device is also configured to command the register device to provide a service corresponding to the electronic coupon to be collected when the validity of the electronic coupon to be collected is confirmed.

20 13. The system of claim 11, wherein the second information contained in the seventh response message and the eighth request message includes an electronic signature obtained by encrypting at least a portion of data of the electronic coupon that should be protected from alteration, by using a  
25 secret key that is maintained in the server device, and data required for verifying the electronic signature; and

the coupon processing unit of the server device is also configured to verify the validity of the electronic coupon to be collected by verifying the electronic  
30 signature.

14. The system of claim 11, wherein the second information contained in the seventh response message and the eighth request message includes an electronic signature obtained  
35 by encrypting at least a portion of data of the electronic



coupon that should be protected from alteration and the terminal identifier of the radio portable terminal, by using a secret key that is maintained in the server device, and data required for verifying the electronic signature;

5 and

the coupon processing unit of the server device is also configured to verify the validity of the electronic coupon to be collected by verifying the electronic signature.

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15. The system of claim 11, wherein the processing unit of the radio base station is also configured to carry out processing for collecting the electronic coupon that is currently displayed on a display screen of the radio portable terminal.

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16. The system of claim 2, wherein the first communication unit of the radio terminal device is configured to send the first request message to the radio portable terminal that has moved into a covered area of the radio terminal device;

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the second communication unit of the radio base station is also configured to receive data or coupon identifiers of electronic coupons to be sent to the radio portable terminal from the server device in response to the second request message;

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the coupon processing unit of the server device is configured to check whether the radio portable terminal of the terminal identifier contained in the second request message is the electronic coupon sending/collecting target or not by referring to information regarding the terminal identifier of the radio portable terminal contained in the second request message, to determine the electronic coupons to be sent to the radio portable terminal that is the electronic coupon sending/collecting target, and to judge whether each electronic coupon to be sent has been sent to

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the radio portable terminal within a prescribed period of time by referring to information registering the terminal identifier of the radio portable terminal, coupon identifiers indicating electronic coupons that have already been sent to the radio portable terminal and information on times at which the electronic coupons that have already been sent to the radio portable terminal were sent; and

the communication unit of the server device is also configured to send the data or the coupon identifiers of only those electronic coupons to be sent that are judged as not having been sent to the radio portable terminal within the prescribed period of time, to the radio base station in response to the second request message.

17. A radio base station device for sending/collecting an electronic coupon to/from a radio portable terminal by using the radio LAN, comprising:

a first communication unit configured to send a first request message requesting a notification of a terminal identifier of the radio portable terminal to the radio portable terminal through the radio LAN, and to receive a first response message notifying the terminal identifier of the radio portable terminal from the radio portable terminal through the radio LAN in response to the first request message;

a second communication unit configured to send to a server device a second request message containing the terminal identifier notified by the first response message and requesting a check of whether the radio portable terminal of the terminal identifier notified by the first response message is an electronic coupon sending/collecting target or not, and to receive a second response message indicating a result of the check from the server device in response to the second request message; and

a processing unit configured to carry out processing

for sending/collecting the electronic coupon with respect to the radio portable terminal through the radio LAN, when the result of the check notified by the second response message indicates that the radio portable terminal of the terminal identifier notified by the first response message is the electronic coupon sending/collecting target.

18. The radio base station device of claim 17, further comprising:

10 a radio shielding unit configured to shield radio signals from at least one direction.

19. A radio portable terminal device, comprising:

a communication unit configured to carry out communications with a radio base station of a radio LAN provided in a store;

a storage unit configured to store electronic coupons received from the radio base station through the radio LAN using the communication unit;

20 a display unit for displaying display contents contained in each electronic coupon stored in the storage unit on a display screen; and

a processing unit configured to carry out a processing for receiving any new electronic coupon issued by the store, a processing for using any stored electronic coupon that is usable at the store, and a processing for deleting any used electronic coupon from the storage unit, with respect to the radio base station through the radio LAN using the communication unit.

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20. The device of claim 19, wherein the communication unit of the radio portable terminal device is also configured to receive a first request message requesting a notification of a terminal identifier of the radio portable terminal device from the radio base station through the radio LAN,

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to send a first response message notifying the terminal identifier of the radio portable terminal device to the radio base station through the radio LAN in response to the first request message, and to receive any new electronic coupon from the radio base station through the radio LAN after the first response message is sent to the radio base station; and

the processing unit of the radio portable terminal device is also configured to store any new electronic coupon received by the communication unit into the storage unit.

21. The radio portable terminal device of the claim 20, wherein the communication unit of the radio portable terminal device is also configured to receive a second request message requesting a notification of a display contents description format from the radio base station through the radio LAN, and to send a second response message notifying the display contents description format to the radio base station through the radio LAN in response to the second request message, and to receive the electronic coupon that contains display contents described by the display contents description format notified by the second response message from the radio base station through the radio LAN; and

the processing unit of the radio portable terminal device is also configured to control the display unit to display any new electronic coupon received by the communication unit on the display screen.

22. The device of claim 19, wherein the processing unit of the radio portable terminal device is also configured to carry out a processing for using any stored electronic coupon that is currently displayed on the display screen by the display unit, and to delete data of any stored

electronic coupon that is currently displayed on the display screen from the storage unit, upon receiving a third request message commanding a deletion of the data of a used electronic coupon.

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23. A method for collecting and managing information on a movement of a user having a radio portable terminal in a facility where a plurality of radio base stations of a radio LAN are arranged at a plurality of locations inside the facility and the plurality of radio base stations are connected to a server device through a local network, the method comprising the steps of:

(a) requesting a notification of a terminal identifier of the radio portable terminal that has moved into a covered area of each radio base station, from said each radio base station to the radio portable terminal through the radio LAN, and receiving the notification of the terminal identifier from the radio portable terminal at said each radio base station through the radio LAN;

(b) notifying the terminal identifier notified at the step (a) from said each radio base station to the server device through the local network; and

(c) recording and managing a management information containing the terminal identifier notified at the step (b) and information regarding an arranged location of said each radio base station which notified the terminal identifier at the step (b), at the server device.

24. A system for collecting and managing information on a movement of a user having a radio portable terminal in a facility, the system comprising:

a plurality of radio base stations of a radio LAN that are arranged at a plurality of locations inside the facility; and

a server device connected to the plurality of radio

base stations through a local network;

wherein each radio base station has:

5 a first communication unit configured to request a notification of a terminal identifier of the radio portable terminal that has moved into a covered area of said each radio base station to the radio portable terminal through the radio LAN, and to receive the notification of the terminal identifier from the radio portable terminal through the radio LAN; and

10 a second communication unit configured to notify the terminal identifier received by the first communication unit, to the server device through the local network;

and the server device has:

15 a communication unit configured to receive a notification of the terminal identifier from each radio base station through the local network; and

20 a management unit configured to record and manage a management information containing the terminal identifier received by the communication unit and a location information regarding an arranged location of said each radio base station that notified the terminal identifier received by the communication unit.

25. The system of claim 24, wherein each radio base station also has:

30 a processing unit configured to make a judgement as to whether the radio portable terminal that has moved into the covered area of said each radio base station is staying in the covered area of said each radio base station for over a prescribed period of time or not;

wherein the second communication unit of each radio base station is configured to notify the terminal identifier received by the first communication unit only when the processing unit judges that the radio portable terminal that has moved into the covered area of said each

radio base station is staying in the covered area of said each radio base station for over a prescribed period of time.

5 26. The system of claim 25, wherein the processing unit of each radio base station is configured to make the judgement repeatedly, and the second communication unit of each radio base station is configured to notify the terminal identifier received by the first communication unit  
10 whenever the processing unit judges that the radio portable terminal that has moved into the covered area of said each radio base station is staying in the covered area of said each radio base station for over a prescribed period of time.

15 27. The system of claim 24, wherein the management unit of the server device is configured to record and manage the management information that also contains a time information indicating a time at which the radio portable  
20 terminal is detected in the covered area of said each radio base station.

28. The system of claim 24, wherein:  
one radio base station among the plurality of radio  
25 base stations has:  
the first communication unit that is configured to send a first request message requesting the notification of the terminal identifier of the radio portable terminal to the radio portable terminal through the radio LAN, and to  
30 receive a first response message notifying the terminal identifier of the radio portable terminal from the radio portable terminal through the radio LAN in response to the first request message;

the second communication unit that is also  
35 configured to send to the server device a second request

message containing the terminal identifier notified by the first response message and requesting a check of whether the radio portable terminal of the terminal identifier notified by the first response message is an electronic coupon sending target or not, and to receive a second response message indicating a result of the check from the server device in response to the second request message; and

5 a processing unit configured to carry out  
10 processing for sending the electronic coupon with respect to the radio portable terminal through the radio LAN, when the result of the check notified by the second response message indicates that the radio portable terminal of the terminal identifier notified by the first response message  
15 is the electronic coupon sending target;

and the server device has:

the communication unit that is also configured to receive the second request message from the one radio base station and to send the second response message to the one  
20 radio base station in response to the second request message; and

a coupon processing unit configured to check whether the radio portable terminal of the terminal identifier contained in the second request message is the  
25 electronic coupon sending target or not, and to produce the second response message indicating the result of the check.

29. The system of claim 28, wherein the coupon processing unit of the server device is configured to check whether  
30 the radio portable terminal of the terminal identifier contained in the second request message is the electronic coupon sending target or not by referring to information regarding the terminal identifier of the radio portable terminal of the terminal identifier contained in the second  
35 request message, and to determine the electronic coupons to



be sent to the radio portable terminal only when the radio portable terminal of the terminal identifier contained in the second request message is the electronic coupon sending target.

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30. The system of claim 28, wherein the coupon processing unit of the server device is also configured to judge whether each electronic coupon to be sent has been sent to the radio portable terminal within a prescribed period of time by referring to information registering the terminal identifier of the radio portable terminal, coupon identifiers indicating electronic coupons that have already been sent to the radio portable terminal and information on times at which the electronic coupons that have already been sent to the radio portable terminal were sent; and

the communication unit of the server device is also configured to send the data or the coupon identifiers of only those electronic coupons to be sent that are judged as not having been sent to the radio portable terminal within the prescribed period of time, to the radio base station in response to the second request message.

31. The system of claim 28, wherein said one radio base station is located at a doorway of the facility.

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32. The system of claim 28, wherein the facility is a store, the plurality of radio base stations are arranged at a plurality of corners provided inside the store, and the location information regarding the arranged location of said each radio base station indicates a corner at which said each radio base station is arranged.

33. The system of claim 32, wherein the management information contains at least the terminal identifier of the radio portable terminal of the user, the location

information indicating a corner at which said each radio base station is arranged, a time information indicating a time at which the radio portable terminal is detected in the covered area of said each radio base station, and a product information regarding products purchased by the user that is entered from a register device for executing a transaction for the user of the radio portable terminal.

34. The system of claim 33, wherein at least one radio base station among the plurality of the radio base stations is arranged in a vicinity of the register device.

35. The system of claim 28, wherein another radio base station among the plurality of radio base stations has:  
the first communication unit that is configured to send a first request message requesting the notification of the terminal identifier of the radio portable terminal to the radio portable terminal through the radio LAN, and to receive a first response message notifying the terminal identifier of the radio portable terminal from the radio portable terminal through the radio LAN in response to the first request message;

the second communication unit that is also configured to send to the server device a second request message containing the terminal identifier notified by the first response message and requesting a check of whether the radio portable terminal of the terminal identifier notified by the first response message is an electronic coupon collecting target or not, and to receive a second response message indicating a result of the check from the server device in response to the second request message; and

a processing unit configured to carry out processing for collecting the electronic coupon with respect to the radio portable terminal through the radio



for acquiring coupon made by the user; and

collecting the electronic coupon from the radio portable terminal at the one radio base station or another radio base station provided in the facility by using the radio LAN, and providing a service corresponding to the electronic coupon to the user, in response to a request for using acquired coupon made by the user.

38. A method for providing an electronic coupon service in a facility to a user of the facility who has a radio portable terminal by using a radio LAN provided in the facility, the method comprising the steps of:

sending an electronic coupon automatically from one radio base station arranged at one location in the facility to the radio portable terminal that has moved into a covered area of the one radio base station by using the radio LAN; and

collecting the electronic coupon from the radio portable terminal at another radio base station arranged at another location in the facility by using the radio LAN, and providing a service corresponding to the electronic coupon to the user.

39. A method for obtaining information regarding activities of a customer having a radio portable terminal in a store where a plurality of radio base stations of a radio LAN are arranged at a plurality of locations inside the facility and the plurality of radio base stations are connected to a server device through a local network, the method comprising the steps of:

(a) at each radio base station, detecting the radio portable terminal that has moved into a covered area of said each radio base station by using the radio LAN, and notifying a detection of the radio portable terminal from said each radio base station to the server device through

the local network; and

(b) at the server device, recording a user movement information on a movement of the user according to information regarding an arranged location of said each radio base station which notified the detection of the radio portable terminal at the step (a), and managing the user movement information in relation to other information regarding purchases made by the user or services received by the user in the store.

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